

SUMMARY OF RECEIVING STREAM DATA

Worksheet 3

Prepared by: AJP

Date: 1/25/12

1. Case Name: American Refining Group, Inc.

Permit No.: PA0002674 –
Amendment No. 1

Municipality: Bradford City (002) and Foster Township (004)

County: McKean

2. Outfalls: 002 & 004

USGS Quad: Bradford 002
004

Latitude: 41° 57' 58.66"
41° 58' 47"

Longitude: 78° 37' 53.38"
78° 37' 30"

3. Name of Receiving Stream: Tunungwant Creek

Drainage List: P

Designated Uses: Statewide Plus WWF

Existing Use: WWF

Exceptions to Specific Criteria: Add ----

Delete ----

Perennial Stream

Gage Name: Brokenstraw Creek @ Youngsville Q₇₋₁₀ at Gage 43.57 cfs Yield rate 0.14 c fsm

Intermittent Stream

Impoundment

Nearest Downstream Use: PA/NY state Border

Location: Tuna Creek approx. 3 miles below the facility.

4. Receiving Stream is Tributary to: Allegheny River

Drainage List: P

Designated Uses: Statewide CWF
Plus

Exception to Specific Criteria: Add ----

Delete: ----

5. Downstream Impoundment Impacted by Discharge:

Allegheny Reservoir

Distance Below
Discharge: 30 miles

Location:

Size: 48.77 Volume: 707,288,000
cubic meters Retention Period: 77
days at stream flow:

6. Basis for determining instream background concentrations:
sources of concentrations. WQN 858.

See Water Quality Protection Report for

(Effect of Discharges on Receiving Waters)

7.	<u>Specific Substance</u>	<u>Requirements to meet Water Quality Standards</u>		
		<u>Ave. Mon.</u>	<u>Daily Max.</u>	<u>Inst. Max.</u>
	Outfall 002			
a.	Fecal Coliform (05/01 – 09/30)		200/100 ml as a geometric avg	
b.	TRC (5/01-9/30)	0.5 mg/l		1.6 mg/l
c.	pH	Min. – 6.0; Max. – 9.0		
	Outfall 004			
a.	Dissolved Iron	4.5 mg/l	7 mg/l	7 mg/l
b.	Benzene	0.16 mg/l	0.32 mg/l	0.4 mg/l
c.	Benzo(a)Anthracene	0.93 ug/l	1.8 ug/l	2.3 ug/l
d.	Benzo(a)Pyrene	0.93 ug/l	1.8 ug/l	2.3 ug/l
e.	Benzo(k)Fluoranthene	0.93 ug/l	1.8 ug/l	2.3 ug/l
f.	Dibenzo(a,h)Anthracene	0.93 ug/l	1.8 ug/l	2.3 ug/l
g.	Naphthalene	0.35 mg/l	0.7 mg/l	0.87 mg/l
h.	Phenanthrene	0.02 mg/l	0.04 mg/l	0.05 mg/l
8.	Water Quality Management Requirements:			
	<input checked="" type="checkbox"/> Project Conforms			
	<input type="checkbox"/> Project does not conform; explain on separate attached sheet to reference other documents under remarks.			
9.	Remarks:	Chlorine disinfection with dechlorination equipment is being installed to meet the fecal coliform limit. Therefore, permit will now need a TRC limit when chlorine is being used. A winter fecal coliform limit was determined not to be needed.		
		Outfall 004 will now accept non contaminated groundwater in addition to NCCW & SW. The new wastestream is not being considered process wastewater defined under ELG, and will not be permitted as such.		

APPROVALS

10. Review Permits/WQ _____ Date _____

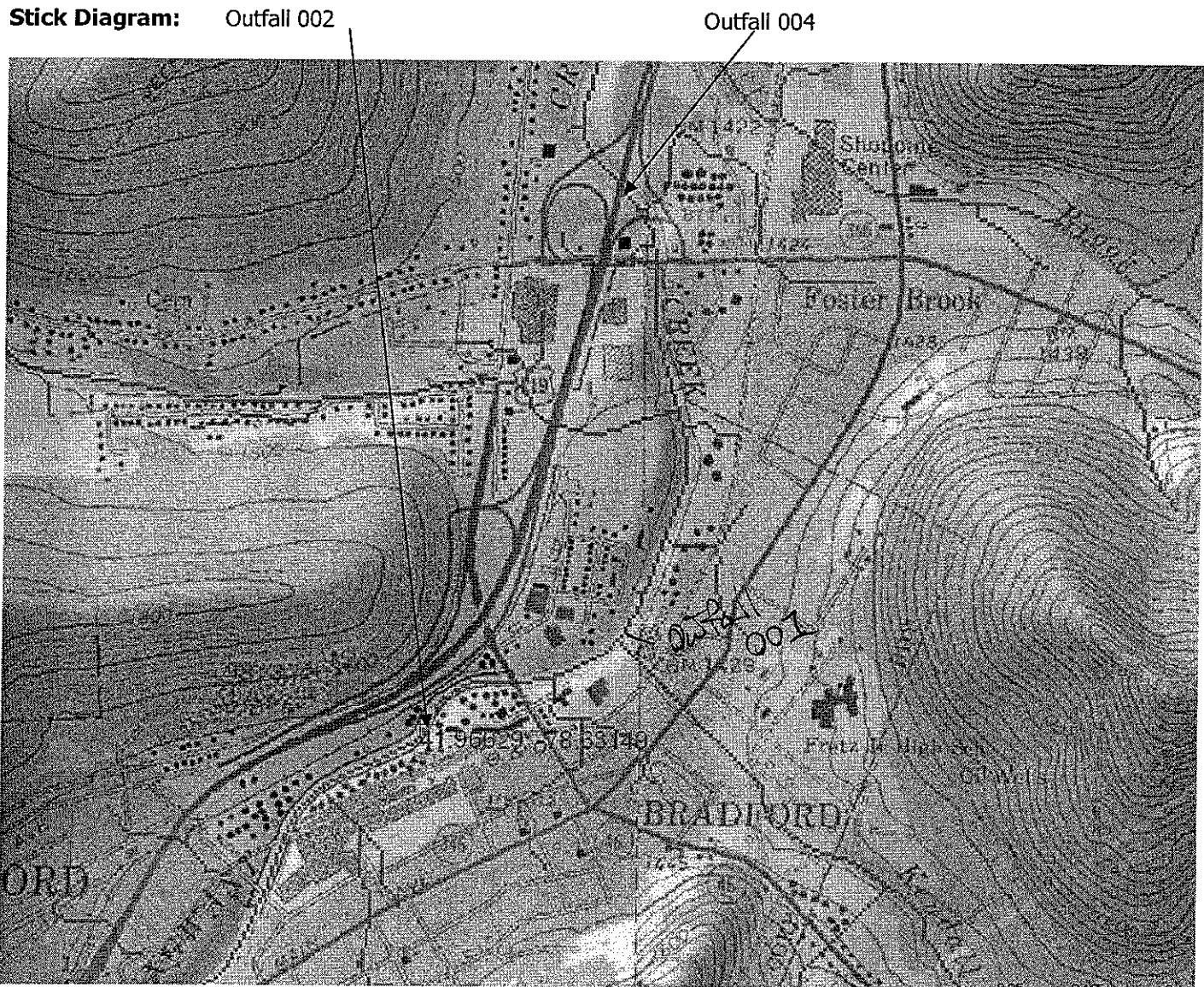
Chief Permits/WQ Darlene Balog Date 3/1/12

Permittee Name: American Refining Group

Municipality: Foster Twp, Bradford City **County:** McKean

Permit No.: PA0002674 – Amendment No. 1

Narrative: Amendment to add chlorine disinfection to Outfall 002, new design flow for Outfall 002, and the addition of contaminated groundwater (30 gpm) to the wastestream of Outfall 004.



1. Streamflow:

The Q₇₋₁₀ flow will be determined by using the following... (Indicate gaging station or reservoir to be used with any other pertinent information).

USGS 02015500 Brokenstraw Creek at Youngsville, PA ('70 -'96 data). Previous WQPRs indicate this reference gage offers the best data for comparison, even though geologic conditions differ between the two watersheds.

The gage on Kinzua Creek @ Guffey has perhaps the most similarities, but the drainage area is substantially Smaller at the gage.

(stream) D.A. =	<u>321</u>	mi ² ; Q ₇₋₁₀ =	<u>43.57</u>	cfs; c fsm =	<u>0.14</u>
(002) D.A. =	<u>101.010</u>	mi ² ; Q ₇	<u>14.1414</u>	cfs; MGD =	<u>9.14</u>
(004)D.A. =	<u>122.96</u>	mi ² ; Q ₇	<u>17.2144</u>	cfs; MGD =	<u>11.1276</u>

2. Wasteflow:

Outfall 001:

<u>002</u>	<u>0.1978</u>	MGD	<u>0.306</u>	cfs
<u>004</u>	<u>0.0648</u>	MGD	<u>0.10022</u>	cfs

Comments: These are long term average flows. Outfall 004 includes estimated 30 gpm from GW remediation Wells and 15 gpm average flow from steam condensate and stormwater in the existing wastestream.

3. Parameters:

The following parameters will be evaluated:

pH, total suspended solids, fecal coliform, phosphorus, NO₂-NO₃, fluoride, phenolics, TDS, sulfate, chloride, NH₃-N, CBOD₅, dissolved oxygen and total residual chlorine.

a. pH: Between 6.0 and 9.0

b. Total Suspended Solids:

Apply technology-based effluent limits unless the drainage swales and ditches paper is applicable.

160 lbs/day as a monthly average

249 lbs/day as a maximum daily

Basis: BPT40 CFR 419.12 Petroleum Refining Subpart A – Topping

c. Fecal Coliform:

1. May 1 through September 30: The fecal coliform level shall not exceed a geometric mean of 200/100ml (mon. ave.)
2. The remainder of the year (October 1 to April 30): (see below)

Background stream amount: 50/100 ml

Basis: Estimated

Criteria: 2000/100ml

Winter/Summer Q₇₋₁₀ ratio if applicable: _____

Q₇₋₁₀ flow to be used: 14.14

Mass balance: 0.306(X) + 14.14(50) = 14.446(2000) => X = 92,107/100 ml

Limit: Wintertime limit not needed.

Basis: Fecal sampling was conducted weekly from May 2011 to mid-January 2012.

Results indicate highest recorded value to be 19700/100 ml with a geo mean for Entire period of 260/100 ml. Furthermore, data shows trend of lower fecal readings during cold weather periods, indicating fecal coliform should not be a concern from 10/1 – 4/30 in approaching or exceeding the calculated limit.

d. Phosphorus:

- Limit Necessary due to: (explain below)
 Discharge to lake, pond, or impoundment
 Discharge to stream
 Limit not necessary: (explain below)

Basis: Chapter 96.5 does not apply

e. NO₂-NO₃, Fluoride, Phenolics, TDS, Sulfate and Chloride:

The existing/proposed downstream potable water supply (PWS) considered during the evaluation is PA/NY State Line on Tunungwant Creek, approx. 3 miles downstream from the point of discharge.

- No limit necessary (explain below).
 Limit needed (explain below).

Basis: See attached calculations.

f. NH₃-N:

Median pH (discharge):	DMR Data					
	(2006)		Year (2007)		(2008)	
July	Min	Max.	Min.	Max	Min.	Max
	6.4	7.1	6.1	7.1	6.2	6.9
August	6.2	7.2	6.7	7.2	6.3	7.0
September	6.5	7.8	6.7	7.2	6.6	7.5

Any other pH values found on inspection reports, stream surveys, etc.:

Previous WQPR for 004 pH value, Aqualtic Biology Investigation Report – 6/30/2000

Median (discharge) pH to be used: 6.6 (002), 7.4 (004)

Discharge temperature: 37.8°C (002) and 15.6°C (004)

Median pH (stream) to be used: 7.3

Basis: Average of values from stations 1A/13A, 1B/13B, and 1C/13C above ARG from the 2008 Tuna Creek Benthic Macroinvertebrate Study.

Stream Temperature: 17.8°C - WQN 858 (July-September 2000-2003)

Background NH₃-N concentration: 0.1 mg/l.

Basis: Values from stations 1TCLU, 1TCMU, and 1TCRU from Aquatic Biology Investigation

Report dated 6/30/2000. <0.02 mg/l Sampling conducted March 14-16, 2000.

g. CBOD5: Using EPA-DEP simplified Method

D.A. $\leq 500 \text{ mi}^2$ $V = 2.62Q^{0.56} S^{0.083} D.A.^{-0.22}$

D.A. $> 500 \text{ mi}^2$ $V = 1.64Q^{0.56} S^{0.055} D.A.^{-0.15}$

Drainage swale or ditch reach.

$Q(\text{cfs}) = \underline{\quad} [Q_s + Q_d] \quad S(\text{ft/mi}) = \underline{\quad} \quad D.A. (\text{mi}^2) = \underline{\quad}$

$V (\text{mi/day}) = \underline{\quad} \quad \text{Reach length (mi)} = \underline{\quad} \quad \text{Travel time (days)} = \underline{\quad}$

$K_c: 0.06 \times \text{CBOD}_5 \text{ eff.} \quad K_N: 0.7 \text{ days}^{-1} \quad K_R: \text{Internally calculated}$

Background CBOD₅: .45 mg/l. Basis: Aquatic Biology Investigation Report

Dissolved Oxygen goal to be maintained in this reach is: 5 mg/l.

h. Dissolved Oxygen:

Minimum of 3.0 mg/l D.O. required in effluent due to discharge going to a drainage swale or ditch.

n/a mg/l D.O. required as a result of DOSAG modeling.

Discussion: _____

i. Total Residual Chlorine (if applicable, see attached modeling): No, but spreadsheet attached.

0.5 mg/l monthly average limitation is recommended.

Basis: Tech based limit for liquid chlorination/dechlorination. Modeling did not indicate the Need for any more stringent limits.

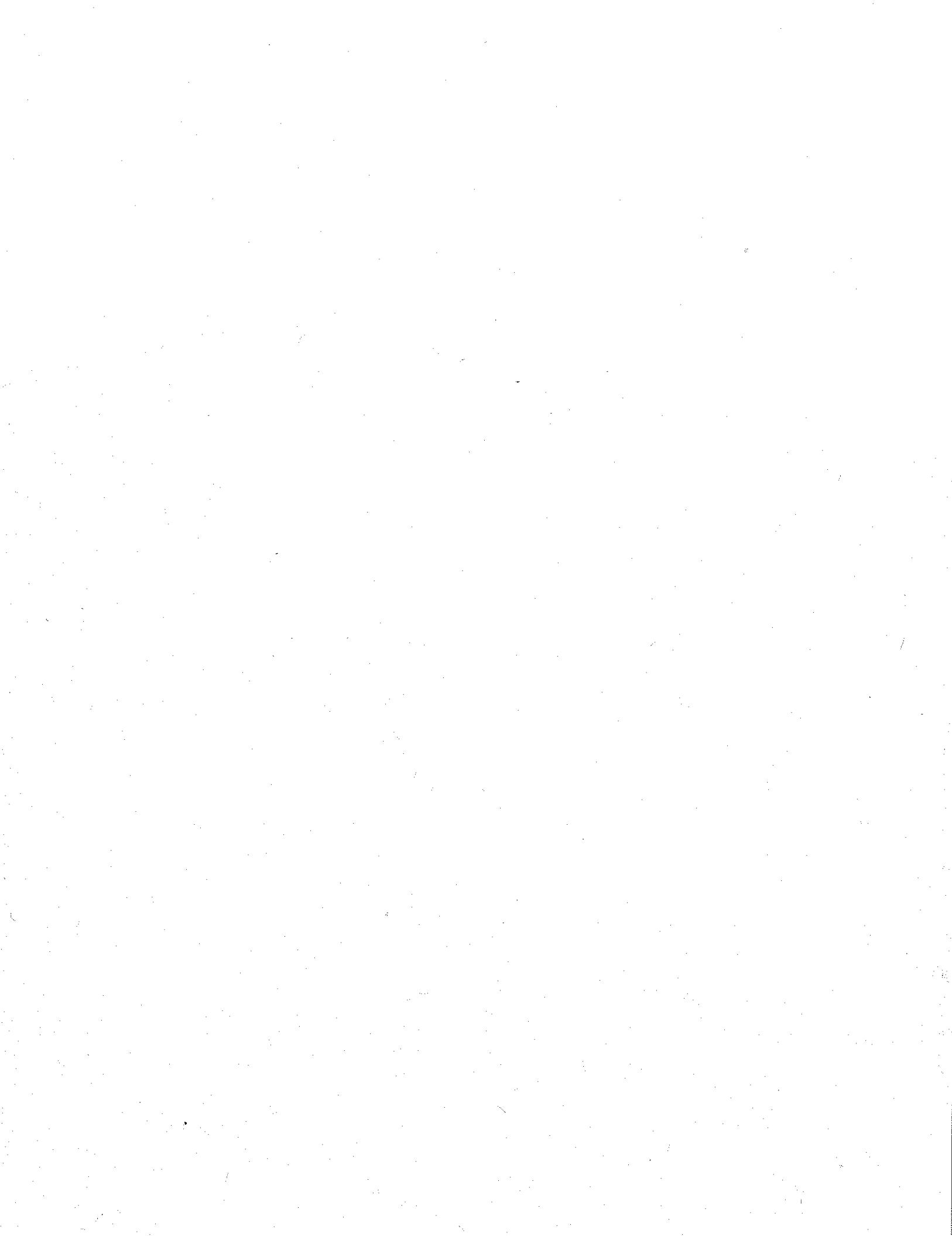
4. Results of Modeling:

TRC limit will be imposed at Outfall 002.

See WQPR for basis of limits monitoring added at Outfall 004 for the addition of contaminated groundwater remediation water.

5. Treatment Summary, Any Problems (meeting limits, O&M, etc.), Other:

Permittee is installing liquid chlorination (sodium hypochlorite), dechlorination (sodium bisulfite) with contact tank to remove fecal coliform during the summer months at the main treatment plant (Outfall 002). At Outfall 002, the permittee is proposing a equalization tank/holding pond, oil/water separator, DAF unit, and the use of carbon filters (questionable).



Water Quality Protection Report

American Refining Group
NPDES No. PA0002674 – Amendment No. 1

Bradford City & Foster Township
McKean County

Wasteflow

<u>Outfall</u>	<u>Source of Pollutants</u>	<u>Flow (MGD)</u>
001	Remediated groundwater (120 gpm)	0.1728 (design)
002	Process wastewater, cooling water, groundwater and stormwater	0.45 (design) 0.1978 (LTA)
004	Remediated groundwater, steam condensate, stormwater	0.0648* (LTA)
005, 007, 008, 009, 010, 012	Stormwater associated with industrial activities	
006, 011	stormwater not associated with industrial activities	

* - See 2/16/2012 email from Shane Reid explaining how the long term average flow was calculated. In brief, 30 gpm attributed to remediated groundwater, 15 gpm attributed to steam condensate and stormwater runoff.

Stream Flow

The continuous gage on Brokenstraw Creek at Youngsville, USGS 0301550, was used to calculate a representative yield rate to apply to Tunungwant Creek. See dissolved oxygen modeling “summary sheet” for calculation of the yield rate.

Stream Background Concentrations

Background water quality was determined using the WQN Gage No. 858 on Tuna Creek above Bradford for data from 1998 to 2004, the Aquatic Biology Investigation Report dated June 30, 2000, using monitoring points approx 2500 feet upstream of Outfall 002, 2008 Tuna Creek Benthic Macroinvertebrate Study using sampling points above ARG, and stream samples taken from Zippo upstream of their discharge in November 2009.

pH had a average of 7.3 S.U. taken from the benthic macroinvertebrate study. Median hardness was 44 mg/l derived as the median value of (1)the average of three upstream samples taken by the Zippo in November 2009 and (2)the median value from sampling at WQN #868 from 1998-2004.

Background toxic concentrations were taken from the Aquatic Biology Investigation Report for Aluminum, Dissolved Iron, Iron (t), and Manganese.

Water Quality Modeling

TRC modeling was done using the TRC spreadsheet (Technology limit was protective).

PWS Evaluation was done using the cumulative discharges of Outfall 001, 002, and 004 to determine if the nearest water supply (NY/PA Line) was being protected (No limits found to be necessary).

PENTOX was run for Outfall 002 to determine if chlorine byproduct parameters would need limitations or monitoring as a result of the use of chlorine disinfection. PENTOX was run for Outfall 004 as a cumulative discharge of Outfall 001 and 004 (0.2376 MGD) and a cumulative discharge of Outfall 001, 002, and 004 (0.4354 MGD) to determine if effluent limits or monitoring was needed as a result of the addition of remediated groundwater.

1,2,4 Trimethylbenzene and 1,3,5 Trimethylbenzene were analyzed using a mass balance equation with provision threshold human health criteria to determine if these parameters required limitations or monitoring. No monitoring or limits were found to be needed. Since the criterion is not official water quality standards thus yet, they are not found in PENTOX. If a limit or monitoring was found to be needed, the criteria would have had to be published in the bulletin as site-specific criteria

Permit Modifications

Total Residual Chlorine @ Outfall 002

The permit was renewed in October 2010 with a compliance schedule to meet a summertime fecal coliform limit. The company decided to use liquid sodium hypochlorite with contact tank and sodium bisulfite to disinfect the effluent and remove fecal coliform presence. Technology based limits for total residual chlorine was added to the permit.

A pilot study was conducted during the review of the WQM permit amendment for treatment plant upgrades (WQM Permit No. 4286201-A1-T1) to determine if any chlorine byproducts would be a concern as a result of chlorinating the high organic wastewater. Results and subsequent modeling showed that chlorine byproducts creation was minimal and did not pose a water quality issue. Sampling results can be found with the WQM permit folder and PENTOX modeling for byproducts with WQ criteria are attached.

Groundwater Remediation Water Addition to Outfall 004

ARG plans to add approximately 30 gpm of contaminated groundwater collected around the Foster Brook Tank Farm and add it to the existing wastestream discharging to Outfall 004. In doing so, ARG plans to construct a new treatment facility that includes flow equalization, oil/water separation, dissolved air flotation (or similar technology), and possibly carbon filtration. The following items will address additions or modification to permit requirements at Outfall 004. TSS – Existing technology based limits were made ~~more~~ more stringent based on Best Professional Judgment (BPJ) and should easily be able to be met using proposed DAF treatment technology.

Total Iron – Limit is based on BPJ determination considering past studies done at the upstream groundwater treatment plant. Although PENTOX modeling indicated a much higher WQBEL, local stream characteristics/discharge characteristics had caused iron staining to occur. Thus, a limit of 3.5 mg/l was deemed to be protective of the stream. This same technology limit will be imposed at Outfall 004. The WQBEL calculated was much less stringent.

Dissolved Iron – Water Quality Based Effluent Limits (WQBELs) were calculated for this parameter using the cumulative discharge scenario with all three discharges since dissolved iron is present in all wastestreams. Dissolved iron was present at levels of concern based on samples collected in September and October 2011. The presence of this parameter is still expected in the plume, although it was not sampled for in the January 31, 2012 sampling event. The instantaneous max limit is a technology based limit.

Benzene – A WQBEL was calculated for this parameter using the cumulative discharge scenario with all three discharges due to presence being expected in all wastestreams. Benzene was present at levels holding reasonable potential in the water plume samples and elevated by levels of magnitude in past sampling, although it was dismissed because it was contaminated by SPL and high in the saturation zone. The WQBEL should be easily achievable given sampling data lower in the aquifer.

Total BTEX – This compound was suggested to be limited in the permit by BPJ determination at direction of both the Water Quality and Environmental Cleanup Programs since it is a good indication of overall Volatile Organic Compound (VOC) presence and treatment effectiveness. Total BTEX is the total cumulative concentration of benzene, toluene, ethylbenzene, and xylene.

PAH Parameters – This references the parameters benzo(a)anthracene, benzo(a) pyrene, benzo(k)fluoranthrene, and dibenzo(a,h)anthracene. PENTOX calculated a WQBEL for these parameters using the cumulative discharge scenario of Outfall 001 and 004 (compounds not known to be present in Outfall 002). These semi-volatile organic compounds were found to be present in the upper saturation zone and SPL but at levels of non-detect in later samples pulled from deep in the water tables. It is not expected for the PAHs to show up lower in the plume due to being SVOCs, but since the WQBEL calculated is so stringent (0.93 ug/l) for all four of these parameters, more sampling is desired once the treatment plant is constructed to determine if these parameters are a concern. The permit provides the permittee the opportunity for sampling to be removed after two years if effluent sampling demonstrates the parameter is not detectable or at a level that does not cause concern.

Naphthalene – A WQBEL was calculated for this parameter using the cumulative discharge scenario of all three outfalls since this is a typical parameter associated with petroleum products. Although barely detectable deeper in the water table, this parameter is found at levels of concern in the upper saturation zone and SPL similar to over SVOCs. The permit provides the permittee the opportunity for sampling to be removed after two years if effluent sampling demonstrates the parameter is not detectable or at a level that does not cause concern.

Phenanthrene – A WQBEL was calculated for this parameter using the cumulative discharge scenario of Outfall 001 and 004 (compounds not known to be present in Outfall 002). This parameter is also detected deeper in the water table at levels that do not directly indicate reasonable potential. Sampling was not done in the upper saturation zone or during the January 12, 2012 sampling event to compare though. Since this is a common parameter associated with petroleum products the limit will be placed in the permit. The permit provides the permittee the opportunity for sampling to be removed after two years if effluent sampling demonstrates the parameter is not detectable or at a level that does not cause concern.

Arsenic and Manganese – The parameters were indicated to be present as a result of sampling. Manganese appeared at all levels of the water table while arsenic was only sampled at monitoring wells. Cumulative modeling indicates that these are parameters of concern, but does not show that water quality standards will be violated at this time. Monitoring requirements will be installed in the permit so that further data can be collected. A manganese limit was warranted based on available data but after consideration of how the groundwater would be treated, it is expected that concentrations will be reduced significantly once processed.

*Chlorine Bypass
Modeling at 002*

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC					
56932	12.20	1425.00	101.01	0.00000	0.00	✓					
Stream Data											
LFY	Trib Flow (cfsm)	Stream Flow (cfs)	WD Ratio (ft)	Rch Width (ft)	Rch Depth (fps)	Rch Velocity (days)	Tributary Hard (mg/L)	Stream Hard (mg/L)	Analysis Hard (mg/L)	pH	pH
Q7-10	0.14	14.1414	0	0	100	0.5	0	44	7.3	0	0
Qh		0	0	0	0	0	0	100	7	0	0
Discharge Data											
Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
ARG	PA0002674	0.2137	0	0	0	0	0	0	0	780	6.6
Parameter Data											
Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)	
ALUMINUM	120	90.3	0.5	0.5	0	0	0	0	1	0	
ARSENIC	217	0	0.5	0.5	0	0	0	0	1	0	
BARIUM	880	0	0.5	0.5	0	0	0	0	1	0	
BORON	860	0	0.5	0.5	0	0	0	0	1	0	
BROMOFORM	2.92	0	0.5	0.5	0	0	0	0	1	0	
CHLORODIBROMOMETHANE	1.18	0	0.5	0.5	0	0	0	0	1	0	
CHLOROFORM	1	0	0.5	0.5	0	0	0	0	1	0	
CHROMIUM, III	1914	0	0.5	0.5	0	0	0	0	1	0	
CHROMIUM, VI	118.6	0	0.5	0.5	0	0	0	0	1	0	
COBALT	10	0	0.5	0.5	0	0	0	0	1	0	
COPPER	35	0	0.5	0.5	0	0	0	0	1	0	
DICHLOROBROMOMETHANE	1	0	0.5	0.5	0	0	0	0	1	0	
DISSOLVED IRON	1120	87.3	0.5	0.5	0	0	0	0	1	0	
MANGANESE	460	83	0.5	0.5	0	0	0	0	1	0	
NICKEL	19	0	0.5	0.5	0	0	0	0	1	0	
Phenolics	727.8	0	0.5	0.5	0	0	0	0	1	0	
SELENIUM	34	0	0.5	0.5	0	0	0	0	1	0	
THALLIUM	3	0	0.5	0.5	0	0	0	0	1	0	
Total Dissolved Solids	4280000	0	0.5	0.5	0	0	0	0	1	0	
TOTAL IRON	4540	256.3	0.5	0.5	0	0	0	0	1	0	
ZINC	97	0	0.5	0.5	0	0	0	0	1	0	

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)		Apply FC				
56932	11.60	1420.00	122.96	0.00000	0.00		<input checked="" type="checkbox"/>				
Stream Data											
LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard pH	Stream Hard pH	Analysis Hard pH	
(cfs/m)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)	(mg/L)	(mg/L)	
Q7-10	0.14	17.2144	0	0	100	0.5	0	44	7.3	0	0
Qh		0	0	0	0	0	0	100	7	0	0
Discharge Data											
Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)							
		0	0	0	0	0	0	0	0	100	7
Parameter Data											
Parameter Name	Disc Conc	Trib Conc	Disc Daily CV	Disc Hourly CV	Stream Conc	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)	
	(µg/L)	(µg/L)			(µg/L)						
ALUMINUM	0	0	0.5	0.5	0	0	0	0	1	0	
ARSENIC	0	0	0.5	0.5	0	0	0	0	1	0	
BARIUM	0	0	0.5	0.5	0	0	0	0	1	0	
BORON	0	0	0.5	0.5	0	0	0	0	1	0	
BROMOFORM	0	0	0.5	0.5	0	0	0	0	1	0	
CHLORODIBROMOMETHANE	0	0	0.5	0.5	0	0	0	0	1	0	
CHLOROFORM	0	0	0.5	0.5	0	0	0	0	1	0	
CHROMIUM, III	0	0	0.5	0.5	0	0	0	0	1	0	
CHROMIUM, VI	0	0	0.5	0.5	0	0	0	0	1	0	
COBALT	0	0	0.5	0.5	0	0	0	0	1	0	
COPPER	0	0	0.5	0.5	0	0	0	0	1	0	
DICHLOROBROMOMETHANE	0	0	0.5	0.5	0	0	0	0	1	0	
DISSOLVED IRON	0	0	0.5	0.5	0	0	0	0	1	0	
MANGANESE	0	0	0.5	0.5	0	0	0	0	1	0	
NICKEL	0	0	0.5	0.5	0	0	0	0	1	0	
Phenolics	0	0	0.5	0.5	0	0	0	0	1	0	
SELENIUM	0	0	0.5	0.5	0	0	0	0	1	0	
THALLIUM	0	0	0.5	0.5	0	0	0	0	1	0	
Total Dissolved Solids	0	0	0.5	0.5	0	0	0	0	1	0	
TOTAL IRON	0	0	0.5	0.5	0	0	0	0	1	0	
ZINC	0	0	0.5	0.5	0	0	0	0	1	0	

PENTOXSD Analysis Results

Hydrodynamics

<u>SWP Basin</u>			<u>Stream Code:</u>			<u>Stream Name:</u>					
16C			56932			TUNUNGWANT CREEK					
RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
12.200	14.141	0	14.141	0.33059	0.0016	0.5	100	200	0.2894	0.1267	931.768
11.600	31.356	0	31.356	NA	0	0	0	0	0	0	NA

Qh Hydrodynamics

12.200	75.252	0	75.252	0.33059	0.0016	1.0348	100	96.64	0.7304	0.0502	324.909
11.600	150.93	0	150.93	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
		PA0002674						
AFC								
Q7-10:	CCT (min)	15	PMF	0.126	Analysis pH	7.089	Analysis Hardness	158.51
	Parameter		Stream Conc. ($\mu\text{g/L}$)	Stream CV	Trib Conc. ($\mu\text{g/L}$)	Fate Coef	WQC ($\mu\text{g/L}$)	WQ Obj ($\mu\text{g/L}$)
	BROMOFORM		0	0	0	0	1800	1800
	CHLORODIBROMOMETHANE		0	0	0	0	NA	NA
	CHLOROFORM		0	0	0	0	1900	1900
	DICHLOROBROMOMETHANE		0	0	0	0	NA	NA
CFC								
Q7-10:	CCT (min)	720	PMF	0.879	Analysis pH	7.257	Analysis Hardness	63.066
	Parameter		Stream Conc. ($\mu\text{g/L}$)	Stream CV	Trib Conc. ($\mu\text{g/L}$)	Fate Coef	WQC ($\mu\text{g/L}$)	WQ Obj ($\mu\text{g/L}$)
	BROMOFORM		0	0	0	0	370	370
	CHLORODIBROMOMETHANE		0	0	0	0	NA	NA
	CHLOROFORM		0	0	0	0	390	390
	DICHLOROBROMOMETHANE		0	0	0	0	NA	NA
THH								
Q7-10:	CCT (min)	720	PMF	NA	Analysis pH	NA	Analysis Hardness	NA
	Parameter		Stream Conc. ($\mu\text{g/L}$)	Stream CV	Trib Conc. ($\mu\text{g/L}$)	Fate Coef	WQC ($\mu\text{g/L}$)	WQ Obj ($\mu\text{g/L}$)
	BROMOFORM		0	0	0	0	NA	NA
	CHLORODIBROMOMETHANE		0	0	0	0	NA	NA
	CHLOROFORM		0	0	0	0	NA	NA
	DICHLOROBROMOMETHANE		0	0	0	0	NA	NA
CRL								
Qh:	CCT (min)	324.909	PMF	1				

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number								
12.20	ARG	PA0002674	Parameter	Stream Conc ($\mu\text{g/L}$)	Stream CV	Trib Conc ($\mu\text{g/L}$)	Fate Coef	WQC ($\mu\text{g/L}$)	WQ Obj ($\mu\text{g/L}$)	WLA ($\mu\text{g/L}$)
	BROMOFORM			0	0	0	0	4.3	4.3	983.097
	CHLORODIBROMOMETHANE			0	0	0	0	0.4	0.4	91.451
	CHLOROFORM			0	0	0	0	5.7	5.7	1303.176
	DICHLOROBROMOMETHANE			0	0	0	0	0.55	0.55	125.745

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
12.20	ARG	PA0002674

PENTOXSD Analysis Results

Recommended Effluent Limitations

<u>SWP Basin</u>	<u>Stream Code:</u>	<u>Stream Name:</u>
16C	56932	TUNUNGWANT CREEK

RMI	Name	Permit Number	Disc Flow (mgd)
12.20	ARG	PA0002674	0.2137

Parameter	Effluent Limit ($\mu\text{g/L}$)	Governing Criterion	Max. Daily Limit ($\mu\text{g/L}$)	Most Stringent	
				WQBEL ($\mu\text{g/L}$)	WQBEL Criterion
BROMOFORM	2.92	INPUT	4.556	983.097	CRL
CHLORODIBROMOMETHANE	1.18	INPUT	1.841	91.451	CRL
CHLOROFORM	1	INPUT	1.56	1303.176	CRL
DICHLOROBROMOMETHANE	1	INPUT	1.56	125.745	CRL

Oncall 001 & 004
Combined Discharge

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)		Apply FC
56932	11.60	1420.00	122.96	0.00000	0.00		<input checked="" type="checkbox"/>
Stream Data							
LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time
(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)
Q7-10	0.14	17.2144	0	0	100	0.5	0
Qh		0	0	0	0	0	0
Discharge Data							
Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF
		(mgd)	(mgd)	(mgd)			
Cumulative 2	PA0002674	0.2376	0	0	0	0	0
Parameter Data							
Parameter Name		Disc Conc	Trib Conc	Disc Daily CV	Disc Hourly CV	Steam Conc	Stream CV
		(µg/L)	(µg/L)			(µg/L)	
1,2-DICHLOROETHANE		0.5	0	0.5	0.5	0	0
ANTHRACENE		0.5	0	0.5	0.5	0	0
ANTIMONY		0.58	0	0.5	0.5	0	0
ARSENIC		79.4	0	0.5	0.5	0	0
BENZENE		48.5	0	0.5	0.5	0	0
BENZO(a)ANTHRACENE		5	0	0.5	0.5	0	0
BENZO(a)PYRENE		5	0	0.5	0.5	0	0
BENZO(k)FLUORANTHENE		5	0	0.5	0.5	0	0
CHLOROFORM		0.77	0	0.5	0.5	0	0
CHRYSENE		0.5	0	0.5	0.5	0	0
DIBENZO(a,h) ANTHRACENE		5	0	0.5	0.5	0	0
DIETHYL PHTHALATE		1.6	0	0.5	0.5	0	0
DISSOLVED IRON		7000	87.3	0.5	0.5	0	0
ETHYLBENZENE		7.5	0	0.5	0.5	0	0
FLUORANTHENE		5	0	0.5	0.5	0	0
FLUORENE		0.39	0	0.5	0.5	0	0
INDENO(1,2,3-cd)PYRENE		0.5	0	0.5	0.5	0	0
LEAD		100	0	0.5	0.5	0	0
MANGANESE		13000	83	0.5	0.5	0	0
METHYLENE CHLORIDE		0.37	0	0.5	0.5	0	0
NAPHTHALENE		10	0	0.5	0.5	0	0
PHENANTHRENE		6.3	0	0.5	0.5	0	0
PYRENE		0.5	0	0.5	0.5	0	0
TOLUENE		10	0	0.5	0.5	0	0
TOTAL IRON		47000	256.3	0.5	0.5	0	0
XYLENE		370	0	0.5	0.5	0	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)		Apply FC				
56932	10.40	1414.00	133.30	0.00000	0.00		<input checked="" type="checkbox"/>				
Stream Data											
LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time (days)	Tributary Hard pH	Stream Hard pH	Analysis Hard pH	
(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)	(mg/L)	(mg/L)	
Q7-10	0.14	18.662	0	0	100	0.5	0	77	7.3	0	0
Qh		0	0	0	0	0	0	100	7	0	0
Discharge Data											
Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						100	7
		0	0	0	0	0	0	0	0		
Parameter Data											
Parameter Name	Disc Conc	Trib Conc	Disc Daily CV	Disc Hourly CV	Steam Conc	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)	
	(µg/L)	(µg/L)			(µg/L)						
1,2-DICHLOROETHANE	0	0	0.5	0.5	0	0	0	0	1	0	
ANTHRACENE	0	0	0.5	0.5	0	0	0	0	1	0	
ANTIMONY	0	0	0.5	0.5	0	0	0	0	1	0	
ARSENIC	0	0	0.5	0.5	0	0	0	0	1	0	
BENZENE	0	0	0.5	0.5	0	0	0	0	1	0	
BENZO(a)ANTHRACENE	0	0	0.5	0.5	0	0	0	0	1	0	
BENZO(a)PYRENE	0	0	0.5	0.5	0	0	0	0	1	0	
BENZO(k)-FLUORANTHENE	0	0	0.5	0.5	0	0	0	0	1	0	
CHLOROFORM	0	0	0.5	0.5	0	0	0	0	1	0	
CHRYSENE	0	0	0.5	0.5	0	0	0	0	1	0	
DIBENZO(a,h) ANTHRACENE	0	0	0.5	0.5	0	0	0	0	1	0	
DIETHYL PHTHALATE	0	0	0.5	0.5	0	0	0	0	1	0	
DISSOLVED IRON	0	0	0.5	0.5	0	0	0	0	1	0	
ETHYLBENZENE	0	0	0.5	0.5	0	0	0	0	1	0	
FLUORANTHENE	0	0	0.5	0.5	0	0	0	0	1	0	
FLUORENE	0	0	0.5	0.5	0	0	0	0	1	0	
INDENO(1,2,3-cd)PYRENE	0	0	0.5	0.5	0	0	0	0	1	0	
LEAD	0	0	0.5	0.5	0	0	0	0	1	0	
MANGANESE	0	0	0.5	0.5	0	0	0	0	1	0	
METHYLENE CHLORIDE	0	0	0.5	0.5	0	0	0	0	1	0	
NAPHTHALENE	0	0	0.5	0.5	0	0	0	0	1	0	
PHENANTHRENE	0	0	0.5	0.5	0	0	0	0	1	0	
PYRENE	0	0	0.5	0.5	0	0	0	0	1	0	
TOLUENE	0	0	0.5	0.5	0	0	0	0	1	0	
TOTAL IRON	0	0	0.5	0.5	0	0	0	0	1	0	
XYLENE	0	0	0.5	0.5	0	0	0	0	1	0	

PENTOXSD Analysis Results

Hydrodynamics

<u>SWP Basin</u>		<u>Stream Code:</u>			<u>Stream Name:</u>						
16C		56932			TUNUNGWANT CREEK						
RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
11.600	17.214	0	17.214	0.36756	0.0009	0.5	100	200	0.3516	0.2085	1000+
10.400	35.876	0	35.876	NA	0	0	0	0	0	0	NA

Qh Hydrodynamics

11.600	89.363	0	89.363	0.36756	0.0009	1.0243	100	97.626	0.8760	0.0837	426.13
10.400	169.78	0	169.78	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number	AFC								
11.60	Cumulative 2	PA0002674	Q7-10:	CCT (min)	15	PMF	0.111	Analysis pH	7.205	Analysis Hardness	96.776
	Parameter				Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
	ANTIMONY				0	0	0	0	1100	1100	6841.384
	ARSENIC				0	0	0	0	340	340	2114.61
	LEAD		Dissolved WQC.	Chemical translator of 1 applied.	0	0	0	0	62.317	78.31	487.043
	BENZENE		Dissolved WQC.	Chemical translator of 0.796 applied.	0	0	0	0	640	640	3980.442
	CHLOROFORM				0	0	0	0	1900	1900	11816.94
	1,2-DICHLOROETHANE				0	0	0	0	15000	15000	93291.61
	ETHYLBENZENE				0	0	0	0	2900	2900	18036.38
	METHYLENE CHLORIDE				0	0	0	0	12000	12000	74633.28
	TOLUENE				0	0	0	0	1700	1700	10573.05
	ANTHRACENE				0	0	0	0	NA	NA	NA
	BENZO(a)ANTHRACENE				0	0	0	0	0.5	0.5	3.11
	BENZO(a)PYRENE				0	0	0	0	NA	NA	NA
	BENZO(k)-FLUORANTHENE				0	0	0	0	NA	NA	NA
	CHRYSENE				0	0	0	0	NA	NA	NA
	DIBENZO(a,h) ANTHRACENE				0	0	0	0	NA	NA	NA
	DIETHYL PHTHALATE				0	0	0	0	4000	4000	24877.76
	FLUORANTHENE				0	0	0	0	200	200	1243.888
	FLUORENE				0	0	0	0	NA	NA	NA
	INDENO(1,2,3-cd)PYRENE				0	0	0	0	NA	NA	NA
	NAPHTHALENE				0	0	0	0	140	140	870.722

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number							
11.60	Cumulative 2	PA0002674							
	PHENANTHRENE		0	0	0	0	5	5	31.097
	PYRENE		0	0	0	0	NA	NA	NA
	TOTAL IRON		256.3	0	256.3	0	NA	NA	NA
	DISSOLVED IRON		87.3	0	87.3	0	NA	NA	NA
	MANGANESE		83	0	83	0	NA	NA	NA
	XYLENE		0	0	0	0	1100	1100	6841.384

CFC

Q7-10:	CCT (min)	720	PMF	0.772	Analysis		Hardness	80.309	
					pH	7.282			
	Parameter		Stream Conc. ($\mu\text{g/L}$)	Stream CV	Trib Conc. ($\mu\text{g/L}$)	Fate Coef	WQC ($\mu\text{g/L}$)	WQ Obj ($\mu\text{g/L}$)	WLA ($\mu\text{g/L}$)
	ANTIMONY		0	0	0	0	220	220	8175.496
	ARSENIC		0	0	0	0	150	150	5574.202
	LEAD		0	0	0	0	1.981	2.407	89.435
	BENZENE		0	0	0	0	130	130	4830.975
	CHLOROFORM		0	0	0	0	390	390	14492.92
	1,2-DICHLOROETHANE		0	0	0	0	3100	3100	115200.2
	ETHYLBENZENE		0	0	0	0	580	580	21553.58
	METHYLENE CHLORIDE		0	0	0	0	2400	2400	89187.23
	TOLUENE		0	0	0	0	330	330	12263.24
	ANTHRACENE		0	0	0	0	NA	NA	NA
	BENZO(a)ANTHRACENE		0	0	0	0	0.1	0.1	3.716
	BENZO(a)PYRENE		0	0	0	0	NA	NA	NA
	BENZO(k)-FLUORANTHENE		0	0	0	0	NA	NA	NA
	CHRYSENE		0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
11.60	Cumulative 2	PA0002674						
	DIBENZO(a,h) ANTHRACENE	0	0	0	0	NA	NA	NA
	DIETHYL PHTHALATE	0	0	0	0	800	800	29729.07
	FLUORANTHENE	0	0	0	0	40	40	1486.454
	FLUORENE	0	0	0	0	NA	NA	NA
	INDENO(1,2,3-cd)PYRENE	0	0	0	0	NA	NA	NA
	NAPHTHALENE	0	0	0	0	43	43	1597.938
	PHENANTHRENE	0	0	0	0	1	1	37.161
	PYRENE	0	0	0	0	NA	NA	NA
	TOTAL IRON	256.3	0	256.3	0	1500	1500	59746.62
		WQC = 30 day average. PMF = 1.						
	DISSOLVED IRON	87.3	0	87.3	0	NA	NA	NA
	MANGANESE	83	0	83	0	NA	NA	NA
	XYLENE	0	0	0	0	210	210	7803.882

THH

Q7-10:	CCT (min)	720	PMF	0.772	Analysis pH		NA	Analysis Hardness	NA
					Stream Conc ($\mu\text{g/L}$)	Stream CV			
	Parameter								
	ANTIMONY				0	0	0	5.6	5.6
	ARSENIC				0	0	0	10	10
	LEAD				0	0	0	NA	NA
	BENZENE				0	0	0	NA	NA
	CHLOROFORM				0	0	0	NA	NA
	1,2-DICHLOROETHANE				0	0	0	NA	NA
	ETHYLBENZENE				0	0	0	530	530
	METHYLENE CHLORIDE				0	0	0	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
11.60	Cumulative 2	PA0002674						
	TOLUENE	0	0	0	0	1300	1300	48309.75
	ANTHRACENE	0	0	0	0	8300	8300	308439.2
	BENZO(a)ANTHRACENE	0	0	0	0	NA	NA	NA
	BENZO(a)PYRENE	0	0	0	0	NA	NA	NA
	BENZO(k)-FLUORANTHENE	0	0	0	0	NA	NA	NA
	CHRYSENE	0	0	0	0	NA	NA	NA
	DIBENZO(a,h) ANTHRACENE	0	0	0	0	NA	NA	NA
	DIETHYL PHTHALATE	0	0	0	0	17000	17000	631742.8
	FLUORANTHENE	0	0	0	0	130	130	4830.975
	FLUORENE	0	0	0	0	1100	1100	40877.48
	INDENO(1,2,3-cd)PYRENE	0	0	0	0	NA	NA	NA
	NAPHTHALENE	0	0	0	0	NA	NA	NA
	PHENANTHRENE	0	0	0	0	NA	NA	NA
	PYRENE	0	0	0	0	830	830	30843.92
	TOTAL IRON	256.3	0	256.3	0	NA	NA	NA
	DISSOLVED IRON	87.3	0	87.3	0	300	300	7991.518
	MANGANESE	83	0	83	0	1000	1000	34159.95
	XYLENE	0	0	0	0	70000	70000	2600000

CRL

Qh:	CCT (min)	426.13	PMF	CRL							
				Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
				ANTIMONY	0	0	0	0	NA	NA	NA
				ARSENIC	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
11.60	Cumulative 2	PA0002674						
	LEAD		0	0	0	0	NA	NA
	BENZENE		0	0	0	0	1.2	1.2
	CHLOROFORM		0	0	0	0	5.7	5.7
	1,2-DICHLOROETHANE		0	0	0	0	0.38	0.38
	ETHYLBENZENE		0	0	0	0	NA	NA
	METHYLENE CHLORIDE		0	0	0	0	4.6	4.6
	TOLUENE		0	0	0	0	NA	NA
	ANTHRACENE		0	0	0	0	NA	NA
	BENZO(a)ANTHRACENE		0	0	0	0	0.004	0.004
	BENZO(a)PYRENE		0	0	0	0	0.004	0.004
	BENZO(k)-FLUORANTHENE		0	0	0	0	0.004	0.004
	CHRYSENE		0	0	0	0	0.004	0.004
	DIBENZO(a,h) ANTHRACENE		0	0	0	0	0.004	0.004
	DIETHYL PHTHALATE		0	0	0	0	NA	NA
	FLUORANTHENE		0	0	0	0	NA	NA
	FLUORENE		0	0	0	0	NA	NA
	INDENO(1,2,3-cd)PYRENE		0	0	0	0	0.004	0.004
	NAPHTHALENE		0	0	0	0	NA	NA
	PHENANTHRENE		0	0	0	0	NA	NA
	PYRENE		0	0	0	0	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
11.60	Cumulative 2	PA0002674						
	TOTAL IRON	256.3	0	256.3	0	NA	NA	NA
	DISSOLVED IRON	87.3	0	87.3	0	NA	NA	NA
	MANGANESE	83	0	83	0	NA	NA	NA
	XYLENE	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RM#	Name	Permit Number
11.60	Cumulative 2	PA0002674

PENTOXSD Analysis Results

Recommended Effluent Limitations

<u>SWP Basin</u>	<u>Stream Code:</u>	<u>Stream Name:</u>			
16C	56932	TUNUNGWANT CREEK			
RMI	Name	Permit Number	Disc Flow (mgd)		
11.60	Cumulative 2	PA0002674	0.2376		
Parameter	Effluent Limit ($\mu\text{g/L}$)	Governing Criterion	Max. Daily Limit ($\mu\text{g/L}$)	WQBEL ($\mu\text{g/L}$)	Most Stringent WQBEL Criterion
1,2-DICHLOROETHANE	0.5	INPUT	0.78	92.766	CRL
ANTHRACENE	0.5	INPUT	0.78	308439.2	THH
ANTIMONY	0.58	INPUT	0.905	208.104	THH
ARSENIC	79.4	INPUT	123.877	371.613	THH
BENZENE	48.5	INPUT	75.668	292.945	CRL
BENZO(a)ANTHRACENE	0.928	CRL	1.447	0.928	CRL
BENZO(a)PYRENE	0.928	CRL	1.447	0.928	CRL
BENZO(k)-FLUORANTHENE	0.928	CRL	1.447	0.928	CRL
CHLOROFORM	0.77	INPUT	1.201	1391.487	CRL
CHRYSENE	0.5	INPUT	0.78	0.928	CRL
DIBENZO(a,h) ANTHRACENE	0.928	CRL	1.447	0.928	CRL
DIETHYL PHTHALATE	1.6	INPUT	2.496	15945.64	AFC
DISSOLVED IRON	7000	INPUT	10921.13	7991.518	THH
ETHYLBENZENE	7.5	INPUT	11.701	11560.59	AFC
FLUORANTHENE	5	INPUT	7.801	797.282	AFC
FLUORENE	0.39	INPUT	0.608	40877.48	THH
INDENO(1,2,3-cd)PYRENE	0.5	INPUT	0.78	0.928	CRL
LEAD	89.435	CFC	139.533	89.435	CFC
MANGANESE	13000	INPUT	20282.09	34159.95	THH
METHYLENE CHLORIDE	0.37	INPUT	0.577	1122.954	CRL
NAPHTHALENE	10	INPUT	15.602	558.097	AFC
PHENANTHRENE	6.3	INPUT	9.829	19.932	AFC
PYRENE	0.5	INPUT	0.78	30843.92	THH
TOLUENE	10	INPUT	15.602	6776.897	AFC
TOTAL IRON	47000	INPUT	73327.55	59746.62	CFC
XYLENE	370	INPUT	577.259	4385.051	AFC

Outfall 001, 002, & 003
Combined Discharge

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC							
56932	11.60	1420.00	122.96	0.00000	0.00	<input checked="" type="checkbox"/>							
Stream Data													
LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time (days)	Tributary Hard pH	Stream Hard pH	Analysis Hard pH			
(cfs/m)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)	(mg/L)	(mg/L)			
Q7-10	0.14	17.2144	0	0	100	0.5	0	77	7.3	0	0	0	0
Qh		0	0	0	0	0	0	100	7	0	0	0	0
Discharge Data													
Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH		
		(mgd)	(mgd)	(mgd)									(mg/L)
Cumulative 1	PA0002674	0.4354	0	0	0	0	0	0	0	200	6.9		
Parameter Data													
Parameter Name	Disc Conc	Trib Conc	Disc Daily CV	Disc Hourly CV	Steam Conc	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)			
	(µg/L)	(µg/L)			(µg/L)								
1,2-DICHLOROETHANE	0.5	0	0.5	0.5	0	0	0	0	1	0			
ANTHRACENE	0.5	0	0.5	0.5	0	0	0	0	1	0			
ANTIMONY	0.58	0	0.5	0.5	0	0	0	0	1	0			
ARSENIC	79.4	0	0.5	0.5	0	0	0	0	1	0			
BENZENE	48.5	0	0.5	0.5	0	0	0	0	1	0			
BENZO(a)ANTHRACENE	5	0	0.5	0.5	0	0	0	0	1	0			
BENZO(a)PYRENE	5	0	0.5	0.5	0	0	0	0	1	0			
BENZO(k)FLUORANTHENE	5	0	0.5	0.5	0	0	0	0	1	0			
CHLOROFORM	0.77	0	0.5	0.5	0	0	0	0	1	0			
CHRYSENE	0.5	0	0.5	0.5	0	0	0	0	1	0			
DIBENZO(a,h) ANTHRACENE	5	0	0.5	0.5	0	0	0	0	1	0			
DIETHYL PHTHALATE	1.6	0	0.5	0.5	0	0	0	0	1	0			
DISSOLVED IRON	7000	87.3	0.5	0.5	0	0	0	0	1	0			
ETHYLBENZENE	7.5	0	0.5	0.5	0	0	0	0	1	0			
FLUORANTHENE	5	0	0.5	0.5	0	0	0	0	1	0			
FLUORENE	0.39	0	0.5	0.5	0	0	0	0	1	0			
INDENO(1,2,3-cd)PYRENE	0.5	0	0.5	0.5	0	0	0	0	1	0			
LEAD	100	0	0.5	0.5	0	0	0	0	1	0			
MANGANESE	13000	83	0.5	0.5	0	0	0	0	1	0			
METHYLENE CHLORIDE	0.37	0	0.5	0.5	0	0	0	0	1	0			
NAPHTHALENE	10	0	0.5	0.5	0	0	0	0	1	0			
PHENANTHRENE	6.3	0	0.5	0.5	0	0	0	0	1	0			
PYRENE	0.5	0	0.5	0.5	0	0	0	0	1	0			
TOLUENE	10	0	0.5	0.5	0	0	0	0	1	0			
TOTAL IRON	47000	256.3	0.5	0.5	0	0	0	0	1	0			
XYLENE	370	0	0.5	0.5	0	0	0	0	1	0			

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)		Apply FC						
56932	10.40	1414.00	133.30	0.00000	0.00		<input checked="" type="checkbox"/>						
Stream Data													
LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time (days)	Tributary Hard pH	Stream Hard pH	Analysis Hard pH			
(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)	(mg/L)	(mg/L)			
Q7-10	0.14	18.662	0	0	100	0.5	0	77	7.3	0	0	0	0
Qh		0	0	0	0	0	0	100	7	0	0	0	0
Discharge Data													
Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH		
		(mgd)	(mgd)	(mgd)									
		0	0	0	0	0	0	0	0	100	7		
Parameter Data													
Parameter Name	Disc Conc	Trib Conc	Disc Daily CV	Disc Hourly CV	Steam Conc	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)			
	(µg/L)	(µg/L)			(µg/L)								
1,2-DICHLOROETHANE	0	0	0.5	0.5	0	0	0	0	1	0			
ANTHRACENE	0	0	0.5	0.5	0	0	0	0	1	0			
ANTIMONY	0	0	0.5	0.5	0	0	0	0	1	0			
ARSENIC	0	0	0.5	0.5	0	0	0	0	1	0			
BENZENE	0	0	0.5	0.5	0	0	0	0	1	0			
BENZO(a)ANTHRACENE	0	0	0.5	0.5	0	0	0	0	1	0			
BENZO(a)PYRENE	0	0	0.5	0.5	0	0	0	0	1	0			
BENZO(k)-FLUORANTHENE	0	0	0.5	0.5	0	0	0	0	1	0			
CHLOROFORM	0	0	0.5	0.5	0	0	0	0	1	0			
CHRYSENE	0	0	0.5	0.5	0	0	0	0	1	0			
DIBENZO(a,h) ANTHRACENE	0	0	0.5	0.5	0	0	0	0	1	0			
DIETHYL PHTHALATE	0	0	0.5	0.5	0	0	0	0	1	0			
DISSOLVED IRON	0	0	0.5	0.5	0	0	0	0	1	0			
ETHYLBENZENE	0	0	0.5	0.5	0	0	0	0	1	0			
FLUORANTHENE	0	0	0.5	0.5	0	0	0	0	1	0			
FLUORENE	0	0	0.5	0.5	0	0	0	0	1	0			
INDENO(1,2,3-cd)PYRENE	0	0	0.5	0.5	0	0	0	0	1	0			
LEAD	0	0	0.5	0.5	0	0	0	0	1	0			
MANGANESE	0	0	0.5	0.5	0	0	0	0	1	0			
METHYLENE CHLORIDE	0	0	0.5	0.5	0	0	0	0	1	0			
NAPHTHALENE	0	0	0.5	0.5	0	0	0	0	1	0			
PHENANTHRENE	0	0	0.5	0.5	0	0	0	0	1	0			
PYRENE	0	0	0.5	0.5	0	0	0	0	1	0			
TOLUENE	0	0	0.5	0.5	0	0	0	0	1	0			
TOTAL IRON	0	0	0.5	0.5	0	0	0	0	1	0			
XYLENE	0	0	0.5	0.5	0	0	0	0	1	0			

PENTOXSD Analysis Results

Hydrodynamics

<u>SWP Basin</u>			<u>Stream Code:</u>			<u>Stream Name:</u>					
16C			56932			TUNUNGWANT CREEK					
RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
11.600	17.214	0	17.214	0.67356	0.0009	0.5	100	200	0.3578	0.205	1000+
10.400	35.876	0	35.876	NA	0	0	0	0	0	0	NA

Qh Hydrodynamics

11.600	89.363	0	89.363	0.67356	0.0009	1.0181	100	98.223	0.8844	0.0829	427.125
10.400	169.78	0	169.78	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number	AFC						
Q7-10:	CCT (min)	15	PMF	0.113	Analysis pH	7.157	Analysis Hardness	108.555	
	Parameter		Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
	ANTIMONY		0	0	0	0	1100	1100	4287.631
	ARSENIC		0	0	0	0	340	340	1325.268
	LEAD		0	0	0	0	70.612	90.639	353.298
	BENZENE		0	0	0	0	640	640	2494.622
	CHLOROFORM		0	0	0	0	1900	1900	7405.908
	1,2-DICHLOROETHANE		0	0	0	0	15000	15000	58467.7
	ETHYLBENZENE		0	0	0	0	2900	2900	11303.75
	METHYLENE CHLORIDE		0	0	0	0	12000	12000	46774.16
	TOLUENE		0	0	0	0	1700	1700	6626.339
	ANTHRACENE		0	0	0	0	NA	NA	NA
	BENZO(a)ANTHRACENE		0	0	0	0	0.5	0.5	1.949
	BENZO(a)PYRENE		0	0	0	0	NA	NA	NA
	BENZO(k)-FLUORANTHENE		0	0	0	0	NA	NA	NA
	CHRYSENE		0	0	0	0	NA	NA	NA
	DIBENZO(a,h) ANTHRACENE		0	0	0	0	NA	NA	NA
	DIETHYL PHTHALATE		0	0	0	0	4000	4000	15591.39
	FLUORANTHENE		0	0	0	0	200	200	779.569
	FLUORENE		0	0	0	0	NA	NA	NA
	INDENO(1,2,3-cd)PYRENE		0	0	0	0	NA	NA	NA
	NAPHTHALENE		0	0	0	0	140	140	545.698

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number							
11.60	Cumulative 1	PA0002674							
	PHENANTHRENE		0	0	0	0	5	5	19.489
	PYRENE		0	0	0	0	NA	NA	NA
	TOTAL IRON		256.3	0	256.3	0	NA	NA	NA
	DISSOLVED IRON		87.3	0	87.3	0	NA	NA	NA
	MANGANESE		83	0	83	0	NA	NA	NA
	XYLENE		0	0	0	0	1100	1100	4287.631

CFC

Q7-10:	CCT (min)	720	PMF	0.785	Analysis		Hardness	82.835	
					pH	7.269			
Parameter			Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
ANTIMONY			0	0	0	0	220	220	4636.911
ARSENIC			0	0	0	0	150	150	3161.531
LEAD			0	0	0	0	2.049	2.503	52.765
BENZENE			0	0	0	0	130	130	2739.993
CHLOROFORM			0	0	0	0	390	390	8219.979
1,2-DICHLOROETHANE			0	0	0	0	3100	3100	65338.3
ETHYLBENZENE			0	0	0	0	580	580	12224.58
METHYLENE CHLORIDE			0	0	0	0	2400	2400	50584.49
TOLUENE			0	0	0	0	330	330	6955.367
ANTHRACENE			0	0	0	0	NA	NA	NA
BENZO(a)ANTHRACENE			0	0	0	0	0.1	0.1	2.108
BENZO(a)PYRENE			0	0	0	0	NA	NA	NA
BENZO(k)-FLUORANTHENE			0	0	0	0	NA	NA	NA
CHRYSENE			0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
11.60	Cumulative 1	PA0002674						
	DIBENZO(a,h) ANTHRACENE	0	0	0	0	NA	NA	NA
	DIETHYL PHTHALATE	0	0	0	0	800	800	16861.5
	FLUORANTHENE	0	0	0	0	40	40	843.075
	FLUORENE	0	0	0	0	NA	NA	NA
	INDENO(1,2,3-cd)PYRENE	0	0	0	0	NA	NA	NA
	NAPHTHALENE	0	0	0	0	43	43	906.305
	PHENANTHRENE	0	0	0	0	1	1	21.077
	PYRENE	0	0	0	0	NA	NA	NA
	TOTAL IRON	256.3	0	256.3	0	1500	1500	33285.48
	WQC = 30 day average. PMF = 1.							
	DISSOLVED IRON	87.3	0	87.3	0	NA	NA	NA
	MANGANESE	83	0	83	0	NA	NA	NA
	XYLENE	0	0	0	0	210	210	4426.143

THH

Q7-10:	CCT (min)	720	PMF	0.785	Analysis		NA	Analysis Hardness	NA
					Stream Conc (µg/L)	Stream CV			
	Parameter				Trib Conc (µg/L)	Fate Coef			
	ANTIMONY	0	0	0	0	0	5.6	5.6	118.03
	ARSENIC	0	0	0	0	0	10	10	210.769
	LEAD	0	0	0	0	0	NA	NA	NA
	BENZENE	0	0	0	0	0	NA	NA	NA
	CHLOROFORM	0	0	0	0	0	NA	NA	NA
	1,2-DICHLOROETHANE	0	0	0	0	0	NA	NA	NA
	ETHYLBENZENE	0	0	0	0	0	530	530	11170.74
	METHYLENE CHLORIDE	0	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
11.60	Cumulative 1	PA0002674						
	TOLUENE	0	0	0	0	1300	1300	27399.93
	ANTHRACENE	0	0	0	0	8300	8300	174938
	BENZO(a)ANTHRACENE	0	0	0	0	NA	NA	NA
	BENZO(a)PYRENE	0	0	0	0	NA	NA	NA
	BENZO(k)-FLUORANTHENE	0	0	0	0	NA	NA	NA
	CHRYSENE	0	0	0	0	NA	NA	NA
	DIBENZO(a,h) ANTHRACENE	0	0	0	0	NA	NA	NA
	DIETHYL PHTHALATE	0	0	0	0	17000	17000	358306.8
	FLUORANTHENE	0	0	0	0	130	130	2739.993
	FLUORENE	0	0	0	0	1100	1100	23184.56
	INDENO(1,2,3-cd)PYRENE	0	0	0	0	NA	NA	NA
	NAPHTHALENE	0	0	0	0	NA	NA	NA
	PHENANTHRENE	0	0	0	0	NA	NA	NA
	PYRENE	0	0	0	0	830	830	17493.8
	TOTAL IRON	256.3	0	256.3	0	NA	NA	NA
	DISSOLVED IRON	87.3	0	87.3	0	300	300	4570.35
	MANGANESE	83	0	83	0	1000	1000	19410.49
	XYLENE	0	0	0	0	70000	70000	1470000

CRL

Qh:	CCT (min)	427.125	PMF	CRL							
				Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
				ANTIMONY	0	0	0	0	NA	NA	NA
				ARSENIC	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number						
11.60	Cumulative 1	PA0002674						
	LEAD	0	0	0	0	NA	NA	NA
	BENZENE	0	0	0	0	1.2	1.2	160.407
	CHLOROFORM	0	0	0	0	5.7	5.7	761.931
	1,2-DICHLOROETHANE	0	0	0	0	0.38	0.38	50.795
	ETHYLBENZENE	0	0	0	0	NA	NA	NA
	METHYLENE CHLORIDE	0	0	0	0	4.6	4.6	614.892
	TOLUENE	0	0	0	0	NA	NA	NA
	ANTHRACENE	0	0	0	0	NA	NA	NA
	BENZO(a)ANTHRACENE	0	0	0	0	0.004	0.004	0.508
	BENZO(a)PYRENE	0	0	0	0	0.004	0.004	0.508
	BENZO(k)-FLUORANTHENE	0	0	0	0	0.004	0.004	0.508
	CHRYSENE	0	0	0	0	0.004	0.004	0.508
	DIBENZO(a,h) ANTHRACENE	0	0	0	0	0.004	0.004	0.508
	DIETHYL PHTHALATE	0	0	0	0	NA	NA	NA
	FLUORANTHENE	0	0	0	0	NA	NA	NA
	FLUORENE	0	0	0	0	NA	NA	NA
	INDENO(1,2,3-cd)PYRENE	0	0	0	0	0.004	0.004	0.508
	NAPHTHALENE	0	0	0	0	NA	NA	NA
	PHENANTHRENE	0	0	0	0	NA	NA	NA
	PYRENE	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number							
11.60	Cumulative 1	PA0002674							
	TOTAL IRON	256.3	0	256.3	0	NA	NA	NA	NA
	DISSOLVED IRON	87.3	0	87.3	0	NA	NA	NA	NA
	MANGANESE	83	0	83	0	NA	NA	NA	NA
	XYLENE	0	0	0	0	NA	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
11.60	Cumulative 1	PA0002674

PENTOXSD Analysis Results

Recommended Effluent Limitations

<u>SWP Basin</u>	<u>Stream Code:</u>	<u>Stream Name:</u>			
16C	56932	TUNUNGWANT CREEK			
RMI	Name	Permit Number	Disc Flow (mgd)		
11.60	Cumulative 1	PA0002674	0.4354		
Parameter	Effluent Limit ($\mu\text{g/L}$)	Governing Criterion	Max. Daily Limit ($\mu\text{g/L}$)	Most Stringent	
1,2-DICHLOROETHANE	0.5	INPUT	0.78	50.795	CRL
ANTHracene	0.5	INPUT	0.78	174938	THH
ANTIMONY	0.58	INPUT	0.905	118.03	THH
ARSENIC	79.4	INPUT	123.877	210.769	THH
BENZENE	48.5	INPUT	75.668	160.407	CRL
BENZO(a)ANTHracene	0.508	CRL	0.792	0.508	CRL
BENZO(a)PYRENE	0.508	CRL	0.792	0.508	CRL
BENZO(k)-FLUORANTHENE	0.508	CRL	0.792	0.508	CRL
CHLOROFORM	0.77	INPUT	1.201	761.931	CRL
CHRYSENE	0.5	INPUT	0.78	0.508	CRL
DIBENZO(a,h) ANTHRACENE	0.508	CRL	0.792	0.508	CRL
DIETHYL PHTHALATE	1.6	INPUT	2.496	9993.448	AFC
DISSOLVED IRON	4570.35	THH	7130.481	4570.35	THH
ETHYLBENZENE	7.5	INPUT	11.701	7245.25	AFC
FLUORANTHENE	5	INPUT	7.801	499.672	AFC
FLUORENE	0.39	INPUT	0.608	23184.56	THH
INDENO(1,2,3-cd)PYRENE	0.5	INPUT	0.78	0.508	CRL
LEAD	52.765	CPC	82.321	52.765	CFC
MANGANESE	13000	INPUT	20282.09	19410.49	THH
METHYLENE CHLORIDE	0.37	INPUT	0.577	614.892	CRL
NAPHTHALENE	10	INPUT	15.602	349.771	AFC
PHENANTHRENE	6.3	INPUT	9.829	12.492	AFC
PYRENE	0.5	INPUT	0.78	17493.8	THH
TOLUENE	10	INPUT	15.602	4247.216	AFC
TOTAL IRON	33285.48	CFC	51930.7	33285.48	CFC
XYLENE	370	INPUT	577.259	2748.198	AFC

not known to be present

PWS Evaluation for ARG Bradford

001+002+

<u>Parameter</u>	<u>Flow @ PWS</u>	<u>Bckg</u>	<u>+</u>	<u>Discharge Flow</u>
Chloride	18.84	18.7		0.4354
TDS	18.84	221.2		0.4354
Fluoride	18.84	0		0.4354
NO3-NO2	18.84	0.31		0.4354
Sulfate	18.84	12		0.4354
Phenolics	18.84	0		0.4354

	<u>Total Flow</u>	<u>Criteria</u>	<u>001/002/004 Discharge Conc.</u>
Allowable Discharge	19.2754		
=	19.2754	250	non-detect
	19.2754	500	4280/138
	19.2754	2	0.5
	19.2754	10	0.5
	19.2754	250	47.8/11.3
	19.2754	0.005	0/0.01

Parameter Review for Trimethyl Benzene (using proposed THH criteria).

<u>Parameter</u>	<u>Flow @ PWS</u>	<u>Bckg</u>	<u>+</u>	<u>Discharge Flow</u>	<u>Allowable Discharge</u>	<u>=</u>	<u>Total Flow</u>	<u>Criteria</u>	<u>001/002/004 Discharge Conc.</u>
1,2,4-TMB	17.2144	0		0.4354	2.878125		17.6498	0.071	0.072
1,3,5-TMB	17.2144	0		0.4354	2.878125		17.6498	0.071	0.072

Total Residual Chlorine Evaluation

Discharger: American Refining Group
Location: Bradford City & Foster Twp., McKean Cnty
NPDES PA# PA0002674

Determination of Highest Flowrate allowed to have
a limit of 0.5 mg/l

Enter the Technology Based Effluent Limit

0.5 mg/l

Enter the Discharge Flow (Qd)

0.6615 mgd

0.02756 MGH

459 GPM

Enter the Stream Flow (Qs)

14.1414 cfs

Enter the Stream Chlorine Demand (Xs)

0.4

Enter the Discharge Chlorine Demand (Xd)

0.3

CALCULATE MIXING RELATIONSHIPS

Enter the Drainage Area

101.01 mi^2

Enter the Slope

0.001578 ft/ft

Enter the Reach Length

3168 ft

Optional site specific data

Enter the Width

100 ft

Enter the Depth

0.5 ft

Enter the W/D Ratio

0

Enter the desired Factor of Safety (FOS)

0 decimal percentage

The Acute Partial Mix Factor (Yc) is

0.133

The Chronic Partial Mix Factor (Yc) is

0.921

The Hourly Cv

0.5

The Daily Cv

0.5

ACUTE CRITERIA EVALUATION

Assuming No Instream Fate, the WLA equation is....

.019 + [(Yc,a x Qs x .019)/Qd + Xd + (Yc,a x Qs x Xs)/Qd]*1-FOS

The WLA based on acute criteria

1.089 mg/l

The Long Term Average

0.406 mg/l

The Average Monthly Limit

0.500 mg/l

CHRONIC CRITERIA EVALUATION

Assuming No Instream Fate, the WLA equation is....

.011 + [(Yc,c x Qs x .011)/Qd + Xd + (Yc,c x Qs x Xs)/Qd]*1-FOS

The WLA based on chronic criteria

5.542 mg/l

The Long Term Average

3.220 mg/l

The Average Monthly Limit

3.961 mg/l

THE AVERAGE MONTHLY LIMIT IS
THE INSTANTANEOUS MAXIMUM LIMIT IS

0.500 MG/L
1.633 MG/L

Date	Coliforms (colonies/100 ml)	GeoMean
5/5/11	10	260.4644
5/12/11	66	432.2305
5/19/11	176	
5/26/11	340	
6/2/11	92	
6/9/11	67	
6/16/11	366	
6/23/11	158	
6/30/11	160	
7/7/11	860	
7/14/11	53	
7/21/11	640	
7/28/11	5600	
8/4/11	5700	
8/11/11	5100	
8/18/11	4700	
8/25/11	2200	
9/1/2011	55	
9/15/2011	19700	
10/06/11	160	130.985
10/13/11	2300	
10/20/11	280	
10/27/11	380	
11/03/11	4400	
11/10/11	1800	
11/23/11	100	
12/01/11	200	
12/08/11	420	
12/15/11	280	
12/22/11	20	
12/29/11	1	
01/05/12	1	
01/12/12	30	

Date Coliforms (colonies/100 ml)

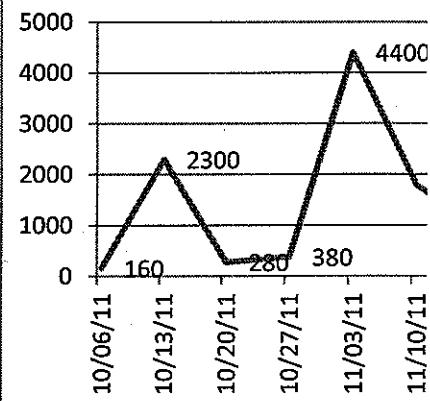
5/5/11	10
5/12/11	66
5/19/11	176
5/26/11	340
6/2/11	92
6/9/11	67
6/16/11	366
6/23/11	158
6/30/11	160
7/7/11	860
7/14/11	53
7/21/11	640
7/28/11	5600
8/4/11	5700
8/11/11	5100
8/18/11	4700
8/25/11	2200
9/1/2011	55
9/15/2011	19700

2011 002 Winter Coliform Study

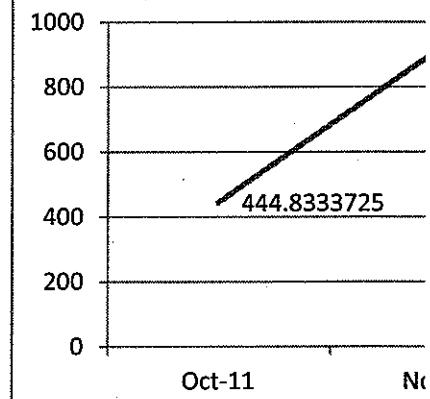
Date	per 100 mL
10/06/11	160
10/13/11	2300
10/20/11	280
10/27/11	380
11/03/11	4400
11/10/11	1800
11/23/11	100
12/01/11	200
12/08/11	420
12/15/11	280
12/22/11	20
12/29/11	1
01/05/12	1
01/12/12	30

Month	Geometric Mean
Oct-11	444.8333725
Nov-11	925.2130018
Dec-11	54.26170833
Jan-12	5.477225575

Fecal Coliforms



Fecal Coliforr



Pesek, Adam

From: Jason Goodling <jgoodling@amref.com>
Sent: Tuesday, January 17, 2012 11:50 AM
To: Pesek, Adam
Subject: ARG Winter Coliform Results
Attachments: 2011 002 Winter Coliforms Geo.xlsx

Hi Adam,
Please see the attached winter coliform concentrations.
Thanks,
Jason

Jason Goodling
Manager of Environmental Affairs
American Refining Group
(P) 814-368-1223
(M) 814-331-7690
(F) 814-368-1427
jgoodling@amref.com

**American Refining Group
Arsenic detections prior to Permit Amendment. Q02**

January 26 2011	Arsenic, Total	0.35 Average Monthly	0.5 Daily Maxit lbs/day	0.099 MO AVG	0.137 Daily Maxit mg/L
February 23 2011	Arsenic, Total	0.42 Average Monthly	0.5791 Daily Maxit lbs/day	0.122 MO AVG	0.164 Daily Maxit mg/L
March 11 2011	Arsenic, Total	0.55 Average Monthly	0.6889 Daily Maxit lbs/day	0.138 MO AVG	0.154 Daily Maxit mg/L
April 20 2011	Arsenic, Total	0.34 Average Monthly	0.5 Daily Maxit lbs/day	0.082 MO AVG	0.121 Daily Maxit mg/L
May 27 2011	Arsenic, Total	0.24 Average Monthly	0.47 Daily Maxit lbs/day	0.064 MO AVG	0.122 Daily Maxit mg/L
June 28 2011	Arsenic, Total	0.39 Average Monthly	0.45 Daily Maxit lbs/day	0.101 MO AVG	0.137 Daily Maxit mg/L
July 21 2011	Arsenic, Total	0.38 Average Monthly	0.55 Daily Maxit lbs/day	0.106 MO AVG	0.162 Daily Maxit mg/L
August 25 2011	Arsenic, Total	0.69 Average Monthly	0.9 Daily Maxit lbs/day	0.183 MO AVG	0.246 Daily Maxit mg/L
September 27 2011	Arsenic, Total	0.41 Average Monthly	0.48 Daily Maxit lbs/day	0.141 MO AVG	0.164 Daily Maxit mg/L
October 28 2011	Arsenic, Total	0.34 Average Monthly	0.61 Daily Maxit lbs/day	0.108 MO AVG	0.172 Daily Maxit mg/L
November 28 2011	Arsenic, Total	0.5 Average Monthly	0.7415 Daily Maxit lbs/day	0.151 MO AVG	0.202 Daily Maxit mg/L
December 28 2011	Arsenic, Total	0.5 Average Monthly	0.582 Daily Maxit lbs/day	0.15 MO AVG	0.178 Daily Maxit mg/L
January 18 2012	Arsenic, Total	0.6 Average Monthly	0.825 Daily Maxit lbs/day	0.156 MO AVG	0.174 Daily Maxit mg/L

**Medium Specific Concentrations (MSCs) for the Storage Tank Short List of Compounds
from the PADEP UST and AST Closure Guidance Documents**

(MSCs prior to Chapter 250 revisions effective January 8, 2011 are shown in parenthesis)

Parameter	Groundwater (ug/l)	Soil DC-Res (mg/kg)	Soil DC-NR 0-2 / 2-15' (mg/kg)	Soil to GW Res / Non-Res (mg/kg)
Anthracene	66 / 66	6600	190000 / 190000	350 / 350
Benzene	5 / 5	57(41)	290(210) / 330(240)	0.5 / 0.5
Benzo(a)anthracene	0.29(0.9) / 3.6	5.7(25)	110 / 190000	25(79) / 320
Benzo(a)pyrene	0.2 / 0.2	0.57(2.5)	11 / 190000	46 / 46
Benzo(b)flouranthene	0.29(0.9) / 1.2	5.7(2.5)	110 / 190000	40(120) / 170
Benzo(ghi)perylene	0.26 / 0.26	130000	170000 / 190000	180 / 180
Chrysene	1.9 / 1.9	570(2500)	11000 / 190000	230 / 230
Cumene	840(1100) / 3500(2300)	7700(7300)	10000 / 10000	600(780) / 2500(1600)
1,2, Dibromomethane	0.05 / 0.05	0.74(.21)	3.7(0.93) / 4.3(8.6)	0.005 / 0.005
1,2, Dichloroethane	5 5	17(12)	86(63) / 98(73)	0.5 / 0.5
Ethyl Benzene	700 700	10000	10000 / 10000	70 / 70
Flourene	1500 / 1900	8800	110000 / 190000	3000 / 3800
Indeno(123cd)pyrene	0.29(0.9) / 3.6	5.7(25)	110 / 190000	2200(7000) / 28000
Lead	5 / 5	500	1000 / 190000	450 / 450
MTBE	20 / 20	620	3200 / 3700	2 / 2
Naphthalene	100 / 100	4400	56000 / 190000	25 / 25
Phenanthrene	1100 / 1100	66000	190000 / 190000	10000 / 10000
Pyrene	130 / 130	6600	84000 / 190000	2200 / 2200
Toluene	1000 / 1000	10000(7600)	10000 / 10000	100 / 100
1,2,4 Trimethyl Benzene	15(16) / 62(35)	130(110)	560(320) / 640(360)	8.4(9) / 35(20)
1,3,5 Trimethyl Benzene	13(16) / 53(35)	110	480(320) / 550(360)	2.3(2.8) / 9.3(6.2)
Xylenes (total)	10000 / 10000	1900(8000)	8000(10000) / 9100(10000)	1000 / 1000